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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,416	09/06/2005	Viktor Nikolaevich Bakunin	I99.12-0001	3712

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EXAMINER

GOLOBOY, JAMES C

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/532,416	Applicant(s) BAKUNIN ET AL.	
	Examiner James Goloboy	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2005 and 06 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/25/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-2, 4, and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-2, 4, and 6 require that the process be carried out by "thermally processing" a molybdic acid salt and a modifier. However, "thermally processing" is not defined, and it is not clear what temperature is sufficient for "thermally processing". In the rejections set forth below, the examiner has considered temperatures above room temperature to be sufficient for "thermally processing".

Claim Rejections - 35 USC § 103

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Devries (US Pat. No. 4,283,295) in view of Brewer (US PG Pub. No. 2004/0259945).

In column 2 lines 3-7, Devries discloses lubricant additives prepared by combining ammonium tetrathiomolybdate, a polar promoter, and a nitrogen-containing compound. The ammonium tetrathiomolybdate meets the limitations of the salt of thiomolybdic acid of claim 1. In column 2 line 51, Devries discloses that the nitrogen-containing compound can be a succinimide, and from column 2

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line 64 through column 3 line 21 discloses that the nitrogen-containing compound can be a succinimide meeting the limitation of that recited in claim 1. In Example 1 (column 6 lines 38-57), Devries discloses that the tetrathiomolybdate and the succinimide are reacted at 155° C. The reaction of the tetrathiomolybdate and the succinimide therefore meets the limitations of the thermal processing of the thiomolybdic acid salt with the second modifier of claims 1 and 3. Devries does not disclose the further addition of a tetraalkylammonium first modifier to the obtained mixture.

Brewer, in paragraphs 25, 94, 169-172, and Figure 4, teaches that tetraalkylammonium tetrathiomolybdate, such as tetrapropylammonium tetrathiomolybdate, has increased stability in comparison to ammonium tetrathiomolybdate. Therefore, it would have been obvious to one of ordinary skill in the art to further add a tetraalkylammonium salt modifier to the product of the tetrathiomolybdate and succinimide of Devries in order to convert the remaining tetrathiomolybdate species to the more stable tetraalkylammonium compounds.

4. Claims 1-3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singerman (U.S. Pat. No. 4,400,282) in view of Anglin (U.S. Pat. No. 4,343,746).

In column 1 lines 13-17, Singerman discloses lubricating oils comprising a minor amount of a tetrahydrocarbyl thiomolybdate. In column 2 lines 15-29 Singerman discloses suitable tetrahydrocarbyl thiomolybdates, some of which meet contain tetrahydrocarbyl groups within the scope of the first modifier of

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claim 1, such as hexdecyltrimethylammonium. In example 1 (column 5 lines 35-56), Singerman discloses that the tetrahydrocarbyl thiomolybdates are formed by reacting an alkali metal molybdic acid salt with a tetraalkylammonium salt, as in the first step of claim 1. In example 3 (column 6 lines 7-37), Singerman discloses that the tetrahydrocarbyl thiomolybdates are combined with a succinimide dispersant, meeting the limitations of adding the second modifier of claim 1. From column 4 line 67 through column 5 line 2, Singerman discloses that the alkali metal thiomolybdates are prepared from a alkali metal molybdate and hydrogen sulfide, meeting the limitations of the molybdic acid salts and sulfur donor of claim 2. The differences between Singerman and the currently presented claims are:

i) Singerman does not disclose a sodium or ammonium thiomolybdate reactant.

ii) Singerman does not disclose thermally processing the thiomolybdate with the tetraalkylammonium modifier.

With respect to i), Anglin teaches in column 2 lines 23-29 that sodium and ammonium thiomolybdates, as recited in claim 1, are suitable starting materials for forming tetrahydrocarbyl thiomolybdates.

With respect to ii), Anglin teaches in column 3 lines 23-26 that temperature is not a critical factor in the reaction. It is therefore the examiner's position that the reaction can include thermal processing, as recited in claim 1. As Anglin teaches in column 3 lines 46-49 that the products are stable up to 170-200° C, the reaction could be carried out at temperatures meeting the limitations

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of claim 3 and 5. While Anglin discloses that it is "convenient" to carry out the reaction at room temperature, this does not constitute a teaching away from performing the reaction at elevated temperature.

It would have been obvious to one of ordinary skill in the art to form the tetrahydrocarbyl thiomolybdates of Singerman from sodium and ammonium thiomolybdates, as taught by Anglin, as Anglin teaches that they are equally suitable starting materials. It would have been obvious to perform the reaction with thermal processing, as Anglin teaches that the temperature of the reaction is not critical, and a higher temperature would lead to a faster reaction.

5. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Singerman in view of Anglin as applied to claims 1-3 and 5 above, and further in view of Pan (U.S. Pat. No. 4,588,829).

The discussion of Singerman and Anglin in paragraph 4 above is incorporated here by reference. Singerman and Anglin disclose a method meeting the limitations of claims 1-2, but do not disclose the polar solvents recited in claims 4 and 6.

From column 3 line 66 through column 4 line 10, Pan discloses the conversion of ammonium thiomolybdate to tetrahydrocarbyl thiomolybdates in methanol, meeting the limitations of the solvent of claims 4 and 6.

It would have been obvious to one of ordinary skill in the art to use the methanol of Pan as the solvent, in order to avoid using the complex two-phase mixture of Singerman and Anglin.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Goloboy whose telephone number is (571)272-2476. The examiner can normally be reached on M-F 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCG

/Glenn A Caldarola/
Acting SPE of Art Unit 1797